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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,088	07/13/2006	Takefumi Nakako	2204-061970	1134

7590 09/02/2009  
Russell D. Orkin  
700 Koppers Building  
436 Seventh Avenue  
Pittsburgh, PA 15219-1818

EXAMINER
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SINGH, SUNIL

ART UNIT	PAPER NUMBER
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3672

MAIL DATE	DELIVERY MODE
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09/02/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,088	<b>Applicant(s)</b> NAKAKO ET AL.	
	<b>Examiner</b> Sunil Singh	<b>Art Unit</b> 3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skogberg et al. or Herron or Davis et al. (US 4509889, 4511289, 4636115).

Skogberg et al., Herron and Davis et al. all disclose a steel pipe rockbolt comprising an expansive rockbolt main body (11, 11,3) made from a shaped pipe having one or more concavities extending along an axial direction, the shaped pipe being made from a steel. Skogberg et al, Herron and Davis et al. all disclose the invention substantially as claimed. However, they all don't disclose the explicit thickness, tensile strength and elongation properties of the steel as called for in claim 1. It would have been considered obvious to one of ordinary skill in the art to modify either Skogberg et al., or Herron, or Davis et al. to use steel having the properties called for in claim 1 since base on design incentives such a modification would have yielded a predictable solution set with reasonable expectation of success. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify either Skogberg et al., or Herron or Davis et al to use steel having the properties as called for in claim 1 since it has been held that where the general conditions of a claim are

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disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify either Skogberg et al. or Herron or Davis et al. to use steel having the properties as called for in claim 1 since such a modification would have been obvious to try base on a finding that there had been a finite number of identified, predictable potential solutions to the recognized need or problem and a finding that one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success.

With regards to claim 2, it would have been considered obvious to modify the steel by coating it with a Zn, Zn-Al or Zn-Al-Mg plating layer to avoid corrosion and provide desired strength.

With regards to claim 4, the recited method steps are considered obvious in view of the combination discussed above.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admission of prior art (see pages 1-3 of specification).

Applicant admits that it is known to have a steel pipe rockbolt, which is firmly fixed to a bedrock or ground in an expanded state, is manufactured from a hollow shaped pipe having one or more expansive concavities extending an axial direction. The steel pipe rockbolt 1 has a sealed end, which is inserted into a rockbolt-setting hole formed in a

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bedrock or ground 2, as shown in Fig. 1. There is a vacancy between the rockbolt-setting hole and the un-expanded steel pipe rockbolt 1 (Fig. 2A). The steel pipe rockbolt 1 is expanded by a hydraulic pressure (Fig. 2B), and finally pressed onto an inner wall of the rockbolt-setting hole (Fig. 2C). Consequently, the bedrock or ground 2 is reinforced with the rockbolt 1. A shaped pipe with at least an expansive concavity 4, which extends along an axial direction, has been used as an expansive rockbolt, in order to facilitate expansion by a hydraulic pressure. The shaped pipe has hermetically sealed top and rear ends and a hole for introduction of a pressurized fluid at its side wall. A shaped steel pipe, which has sleeves fixed to its both ends for introduction of a pressurized fluid, is also disclosed in JP 2003- 501573 A. The expansive steel pipe rockbolts are classified to a 110 kN group and a 170 kN group by yield strength necessary for construction conditions, e.g. competence and geomechanics of a bedrock or ground as well as cross- sectional profiles of tunnels. Rockbolts, which belong to the **110 kN group, are manufactured from steel sheets of 2 mm in thickness with tensile strength of 300 N/mm<sup>2</sup> or more and total elongation of 30% or more.** Rockbolts, which belong to the **170 kN group, are manufactured from steel sheets of 3 mm in thickness with tensile strength of 300 N/mm<sup>2</sup> or more and total elongation of 35% or more.**

The shaped pipe is manufactured by partially bending a cylindrical pipe with a small bending radius in a sectional plane, as shown in Fig. 2A. On the presumption that shaped pipes have the same outer diameter, a bending radius at a center is smaller as a thickness increase of a steel sheet, which is formed to a shaped pipe. The shaped

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pipes are further swaged at its both ends, since sleeves having inner and outer diameters regularized in size are fixed to the end parts of the shaped pipes. A thicker steel sheet is reformed with a smaller bending radius even in the swaging process. That is, a local bending radius becomes smaller as an thickness increase of a steel sheet for raising strength of a rockbolt. The admission of prior art discloses the claimed invention except for the explicit combined thickness, tensile strength and elongation properties of the steel as called for in claim 1. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the 110 kN group to have the tensile strength as called for in claim 1 since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. It should be noted that the admitted prior art states the 110 kN group have tensile strength of 300N/mm<sup>2</sup> **or more**. Therefore, it would have been considered obvious to one of ordinary skill in the art to modify the 100 kN group to have the tensile strength as called for in claim 1 since base on design incentives such a modification would have yielded a predictable solution set with reasonable expectation of success.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the 110 kN group to have the tensile strength as called for in claim 1 since such a modification would have been obvious to try base on a finding that there had been a finite number of identified, predictable potential solutions to the recognized need or problem and a finding that one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success.

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With regards to claim 2, it would have been considered obvious to modify the steel by coating it with a Zn, Zn-A1 or Zn-A1-Mg plating layer to avoid corrosion and provide desired strength.

With regards to claim 4, the recited method steps are considered obvious in view of the combination discussed above.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1, 4 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that the office action failed to establish a prima facie case of obviousness. The examiner disagrees. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify either Skogberg et al., or Herron or Davis et al to use steel having the properties as called for in claim 1 since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify either Skogberg et al. or Herron or Davis et al. to use steel having the properties as called for in claim 1 since such a modification would have been obvious to try base on a finding that there had been a finite number of identified, predictable potential solutions to the recognized need or problem and a finding that one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success.

***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunil Singh whose telephone number is (571) 272-7051. The examiner can normally be reached on Monday through Friday 10:30 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sunil Singh/  
Primary Examiner, Art Unit 3672

Sunil Singh  
Primary Examiner  
Art Unit 3672

SS

8/30/09